DIRECT GAS PRESSURE METHOD FOR SCHEDULING IRRIGATION
(IWMSPDY) VERSION 2.0 USERS GUIDE

Program Documentation

This spreadsheet requires the use of Microsoft Excel®. This spreadsheet uses the procedure in the National Engineering Field Handbook, Chapter 15, Irrigation.

Program Purpose and Description

The primary purpose of this program is to provide the field office with a tool to develop Soil Characteristics Sheets for each typical soil or control area in an irrigated field for the purpose of irrigation scheduling. One Soil Characteristics Sheet will apply to all crops in the same area by using the appropriate effective root zone depths.

Once the Soil Characteristics Sheets have been developed for specific areas in the field, the irrigator needs to make carbide moisture tests of samples from appropriate depths in the field and refer the gage readings to the Soil Characteristics Sheets. The net inches of water to be applied to an area are the sum of the values for the soil layers sampled in the effective root zone depth.

This simplified method of irrigation water management eliminates daily record keeping and the need for estimating the effect of climatic factors and the stage of crop growth on daily consumptive use. It requires no accounting for soil moisture changes caused by rainfall or irrigation.

Refer to National Engineering Field Handbook, Chapter 15 Irrigation, pages 15-43 through 15-48 for detailed description of the procedure used, definitions of the factors and example problems.

Software Requirements

Use of this spreadsheet requires that Microsoft Excel® be installed.

Installing the Program

Place the spreadsheet in the appropriate directory. Open the workbook by double clicking on the file or through the Excel program.

Program Operation

The user can change the values in the spreadsheet which are unprotected. Unprotected cells show on the screen as being bright blue. Values entered by the user include the following: depth from ground surface to bottom of soil layer in inches, sample volume in cubic centimeters, gage reading at field capacity, soil type (see lookup table for soil type "f" factors at Cell AJ30), actual values of field capacity, wilting point or bulk density may be entered if known (enter "0" if not known and use computed values) and will override values computed by the spreadsheet, gage reading of soil sample and irrigation efficiency.

Values for wilting point and bulk density may be obtained from soil surveys and soil characteristic data books.

<u>Example</u>

A typical print out of the program.

Department of Agriculture　　　　　　　　　　　　　Natural Resources Conservation Service

IWM Speedy Program Ver. 2.0

I R R I G A T I O N   W A T E R   M A N A G E M E N T

S O I L   C H A R A C T E R I S T I C S   S H E E T

SOIL TYPE:　　　　　　　　　　　　ORANGEBURG
EFFECTIVE ROOT DEPTH:　　　　　18 INCHES

		Date
FARM:	SAMPLE	
FIELD:	3.0	DESIGNED: EFM　15-Sep-00
CROP:	POTATOES	CHECKED: VCS　16-Sep-00
LOCATION:	UPPER END	APPROVED: JTW　17-Sep-00

Soil Layer	(0 - 14) inches	(14 - 15) inches	(15 - 18) in
	(0 - 35.56) cm.	(36 - 38.1) cm.	(38 - 45.72) cm.
(F.C.) Sample Wt.	0.0575 # 26 grams	0.0575 # 26 grams	0.0575 26 grams
Sample Vol	14 cm³	14.8 cm³	15.2 cm³
Speedy Gage	@ F.C. 16.4	@ F.C. 15.1	@ F.C. 15.9
Soil Type,	(1 thru 5) 4 "f" = 0.33	(1 thru 5) 4 , "f" = 0.33	(1 thru 5) 4 , "f" = 0.33
	sand, sl, ls, l, silt loam	sand, sl, ls, l, silt loam	sand, sl, ls, l, silt loam

ENTER KNOWN VALUE OR 0	Field Capacity percent	Wilting Point percent	Bulk Density g/cm³	Field Capacity percent	Wilting Point percent	Bulk Density g/cm³	Field Capacity percent	Wilting Point percent	Bulk Density g/cm³
	19	6.3	1.56	17.3	5.8	1.50	18.3	6.1	1.45
	18.9	3.8	0.0	17.1	3.4	0.0	18.2	4.6	0.0

Available Moisture Level (percent)	Dry Weight Moisture (percent)	Speedy Tester Gage Reading	Net Water to Apply (cm)	Net Water to Apply (in)	Dry Weight Moisture (percent)	Speedy Tester Gage Reading	Net Water to Apply (cm)	Net Water to Apply (in)	Dry Weight Moisture (percent)	Speedy Tester Gage Reading	Net Water to Apply (cm)	Net Water to Apply (in)
100 (FC)	18.9	16.39	0.0	0.0	17.1	15.09	0.0	0.0	18.2	15.89	0.0	0.0
90	17.4	15.19	0.8	0.3	15.7	14.09	0.1	0.0	16.8	14.85	0.1	0.1
80	15.9	14.15	1.7	0.7	14.4	12.99	0.1	0.0	15.5	13.85	0.3	0.1
70	14.4	12.99	2.5	1.0	13.0	11.89	0.2	0.1	14.1	12.85	0.4	0.2
60	12.9	11.79	3.4	1.3	11.6	10.79	0.2	0.1	12.8	11.75	0.6	0.2
50	11.4	10.59	4.2	1.6	10.3	9.59	0.3	0.1	11.4	10.69	0.7	0.3
40	9.8	9.29	5.0	2.0	8.9	8.39	0.3	0.1	10.0	9.45	0.9	0.4
30	8.3	7.89	5.9	2.3	7.5	7.19	0.4	0.1	8.7	8.19	1.0	0.4
20	6.8	6.49	6.7	2.6	6.1	5.89	0.4	0.2	7.3	6.99	1.2	0.5
10	5.3	5.19	7.5	3.0	4.8	4.69	0.5	0.2	6.0	5.59	1.3	0.5
0 (WP)	3.8	3.79	8.4	3.3	3.4	3.39	0.5	0.2	4.6	4.59	1.5	0.6

Gage Reading (GR) of 10.6 is = 1.6 in.	(GR) of 11.35 is = 0.1 in.	(GR) of 14.4 is = 0.1 in.
11.4 % -------------------- 4.2 cm	12.3 % ------------------ 0.2 cm	16.3 % -------------- 0.2 cm

Total Net Water to apply to all layers = 1.79 inches　　　　　=　　4.55 (cm)
Irrigation Efficency = 70 percent　　　　　　　　　　　　　　70.0 percent
Total Gross Water to apply to crop = 2.56 inches　　　　　=　　6.5 (cm)